ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY INTERVIEWS WITH FRED L. WEISS

BY CHARLES W. CRAWFORD

TRANSCRIBER - BRENDA MEIER

ORAL HISTORY RESEARCH OFFICE

MEMPHIS STATE UNIVERSITY

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INTERVIEW WITH FRED L. WEISS

JULY 16, 1970

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ORAL HISTORY RESEARCH OFFICE

MEMPHIS STATE UNVIERSITY

WEISS FRED TVA

MEMPHIS STATE UNIVERSITY
Oral History Research Office
MEMPHIS, TENNESSEE 38152

August 13, 1980

TO: Eleanor McKay

FROM: Charles Crawford Charles W. Crawford

RE: Release of interviews by Mr. Fred L. Weiss

We are sending, together with this memorandum, the transcript and tapes of the interview with Mr. Fred L. Weiss, conducted on July 16, 1970, as part of the TVA Project.

Since we did not secure a release form at the time of the interview and recent correspondence indicates that Mr. Fred Weiss is deceased, I am releasing the interview transcript and tapes by this memorandum.

THIS IS THE ORAL HISTORY RESEARCH OFFICE OF MEMPHIS STATE UNIVERSITY. THIS PROJECT IS "AN ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY." THE DATE IS JULY 16, 1970 IN ANDREWS, NORTH CAROLINA, AT THE SUMMER HOME OF MR. FRED L. WEISS. THE INTERVIEW IS WITH MR. FRED L. WEISS, FORMERLY WITH THE TENNESSEE VALLEY AUTHORITY IN CONSTRUCTION ENGINEERING. THE INTERVIEW IS BY DR. CHARLES W. CRAWFORD, DIRECTOR OF THE ORAL HISTORY RESEARCH OFFICE OF MEMPHIS STATE UNIVERSITY AND WAS TRANSCRIBED BY MRS. BRENDA P. MEIER.

DR. CRAWFORD: Mr. Weiss, I suggest we start by summing up your career before you became associated with TVA, where and when you were born, something about your education, what you did first and so forth, and then we'll get into other parts of this.

MR. WEISS: I was born in Philadelphia, Pennsylvania on November 6, 1903, and educated in the Philadelphia public schools, and then went on to what is now known as Pennsylvania State University and received my Bachelor of Science degree in Civil Engineering in 1925. I became an engineering employee of the Stone and Webster Engineering Corporation on a steam power plant in Philadelphia. Then from there I went to a dam construction project in Condwingo, Maryland, also with Stone and Webster, as a field engineer. Following that, there was lull in Stone and Webster's employment so I went with the design engineering firm, Concrete Steel Company in Philadelphia, and worked with them for a short

period until construction opened up again in the form of a field assignment with DuPont Engineering Corporation near Charleston, West Virginia, on a anhydrous ammonia plant addition. Then Stone and Webster received a contract for another dam out in Missouri, which is Bagnell Dam on the Osage River, and I went out there with one of my former supervisors from Condwingo Dam.

We were out on the Osage from 1929 until 1932 and when that work was completed it looked as though there would be a possibility (as you know, the country was in a depression at that time) but it looked as though Stone and Webster was going to get some more dam work. But in the meantime they tried to take care of the Shawnee Transmission Line Project, running an additional line from the Bagnell Dam to St. Louis, Missouri. But by the time that work ended the country really was in a deep depression and there wasn't anything more, so for about a year I worked up around Erie, Pennsylvania on some survey work. Then when President Roosevelt's REA program took effect, I went with the subsidiary of Shell Oil, Patterson Oil Company, near Woodbury, New Jersey, as a combination engineer and terminal operator. About that time I heard something of the Tennessee Valley Authority being organized, and I put in an application for it.

DR. CRAWFORD: What year was that, sir?

MR. WEISS: The year I put the application in, I think, was early 1933, and I didn't expect to hear anything more from the Tennessee Valley Authority. But then about October I received word asking that I come to Washington for an interview--which I did--and they were interested in someone who had a background of construc-

tion camp and construction village experience, which I had had with Stone and Webster on both Conowingo Dam and Bagnell Dam. The engineer in that work had been with the construction firm of Tuttle and Company in Boston, Massachusetts, and he knew of the work of Stone and Webster people, so that's why he had contacted me. So I became his job engineer on the construction of the town of Norris.

DR. CRAWFORD: Who was that person?

MR. WEISS: That C. E. Faust--think it was Clarence E. Faust. He left TVA back in 1948, I would guess--somewhere around there--to go with another subsidiary of Stone and Webster on paper plant and oil refinery construction. Well, I stayed on with TVA as job engineer and then toward the end of the construction of the village of the town of Norris, I became a job engineer and assistant superintendent on reservoir relocation construction, which is the relocation of highways and bridges and the removal of bridges in the reservoir area of Norris.

DR. CRAWFORD: After the Norris work, Mr. Weiss, . . .

MR. WEISS: Well, I was going to mention that during the Norris work we did become acquainted with a lot of the top officials of the TVA. We were fortunate in living in a section of Norris where we were practically the neighbor of Arthur E. Morgan who was chief engineer of TVA and Chairman of the Board at that time, and Fred Swimmer, who was superintendent of construction on the completion of Norris Dam, was our immediate next-door neighbor. And it was interesting during the period of our time in Norris that the wives of the engineers

and construction supervisors became interested in the vocational work that was being done by TVA: weaving, art, and that sort of thing. Of course, Mrs. Morgan was quite a gifted person and Mrs. Weiss became very well acquainted with her and they had some delightful visits together.

DR. CRAWFORD: What did you think of the town of Norris when you first undertook that job? Wasn't this unusual for a construction project?

MR. WEISS: Yes, the town of Norris was a little above the normal construction town, but evidently the planning and the foresightedness of Dr. Morgan and others envisioned the town of Norris as not just being the construction village, but something beyond the construction village, which it really became. So an effort was made to put it on a permanent basis--quite different from say Fontana Village and places like that. But as far as the actual construction operations were concerned--the utilities and whatnot, the layout and actual construction of buildings--it was pretty much like any construction village.

DR. CRAWFORD: What part did you have in the construction at Norris?

MR. WEISS: In the construction of Norris I had to start with, the engineering layout and inspection of construction after construction, and then later I actually had the construction traits of supervision also, with a combination of these. Then after the construction of the town of Norris, we did move on . . . Well, I was with what was known, during the construction of the town of Norris, as the Construction Maintenance Division of the Tennessee Valley Authority.

About that time we were thinking of building Hiwassee Dam in North Carolina, and Mr. Clarence E. Blee was named Project Manager. He wanted a field engineer with dam background and he asked my supervisor, Faust, if he couldn't release me to go on to Hiwassee Dam.

DR. CRAWFORD: Did you continue to live at Norris?

MR. WEISS: Oh, I lived in Norris until I was assigned to the Hiwassee Dam project, which was sometime in 1936. We moved to Murphy, North Carolina during the construction of the Norris village. Of course, the Norris village was built just like other TVA construction villages--by the Construction and Maintenance Division under Mr. Faust, so I had nothing to do with the construction village. I was entirely interested in the layout and construction of the early stages of Hiwassee Dam construction.

DR. CRAWFORD: Did you think that Norris was unusually well-planned?

MR. WEISS: Norris was very well planned. I don't know of any great changes that have taken place since the initial construction of the town of Norris. Of course, during the construction of the town of Norris there were lots of changes made by the architects, which is natural on something with the scope of TVA's Norris village. In fact, we had to do a lot of things in order to keep the architect's feet on the ground. The tendency of an architect is to become highly visionary and . . .

DR. CRAWFORD: Did you have any plans for a statue or anything like that at the Norris Dam?

MR. WEISS: We had nothing to do with anything of that sort. I believe there was a tablet or something to a Clare Killian, who had something to do with labor relations at that time, but that's the only thing that I know of.

DR. CRAWFORD: I had heard that there was a plan of some sort of statue holding the water back at Norris Dam.

MR. WEISS: No, sir. I had not heard of that. But the architects did have ideas of really going beyond what should be built from a cost basis for the type of people who were going to occupy the dwellings. And as I said, we had to make them more practical also from a standpoint of changes. They would give us plans and maybe the next week or so we'd get an entirely different set of plans and they would expect us maybe to tear down something. Well, we wouldn't do that. We devised a system whereby we made them sign an order for reconstruction and we estimated what the cost of reconstructing would be. And when they saw what the cost of reconstruction would be they usually would not sign an order for reconstruction, so I think we really held things in a practical construction way.

DR. CRAWFORD: What was the size of Norris when you constructed it and who lived there?

MR. WEISS: I could only make a very vague guess. I would think that we put in about fifty permanent-type houses, anywhere from one to four bedrooms, and most of those houses were brick houses.

Some were board and batten and some were stone, and then they also did try out some prefabs--about three or four prefabs. One, I recall, made by U. S. Steel Company, consisted of prefab steel panels. One thing they did try out in a big way--TVA always tried to promote electricity to its maximum in home use, and there were several houses that were set up with different types of electrical heating. For instance, the house that we lived in was a one-bedroom, board and batten type and they had a central electrical heating unit under the floor connected to overhead fans. It was thermostatically controlled and actually it worked very well. It was a little noisy, but it worked very well. And then there was another house that had radiant heat wiring--silver wiring in the walls and ceiling--and that worked very well, but was rather costly. The wiring had to be put into some special type of plaster for insulating purposes.

DR. CRAWFORD: Were you free to experiment as much as you wished?

MR. WEISS: Oh, yes. Well, that was it. They did experiment quite a bit on this electrical heating.

DR. CRAWFORD: Who were these houses planned for at that time--for supervisory personnel of TVA?

MR. WEISS: Yes, they were for heads of departments and also heads of divisions, and in both Knoxville and those people on the dams.

DR. CRAWFORD: I believe that a number of people did drive out from Knoxville.

MR. WEISS: Yes, that's right. We built, I think, about a fifteen-mile-long freeway that had about 120-foot right-of-way or something like that. It was something unusual for that part of the country at that time, and that connected one of the main highways into Knoxville.

DR. CRAWFORD: Whose plan was the freeway?

MR. WEISS: Well, the TVA had at that time a Highway Division under an experienced highway engineer, and this was all part of TVA's planning and design, and then it was turned over to us for construction.

DR. CRAWFORD: Was Norris increased in size after this original construction of some fifty dwellings?

MR. WEISS: No, as far as I recall, Norris was not increased in size. I mentioned that we did have about fifty permanent dwellings and I should have also mentioned there was a low-cost housing development of concrete blocks and precast floor systems, and this was used to a great extent for the rank and file of construction personnel, and I believe that actually some of those buildings are still standing.

DR. CRAWFORD: How large was that? What was the size? How many construction personnel did you plan to accommodate in that at Norris?

MR. WEISS: Well, as far as I recall, the dam construction personnel did get up to somewhere around two thousand.

DR. CRAWFORD: Did you accommodate a large part of them?

MR. WEISS: We accommodated, I would guess, maybe a quarter of that number since we did have barrack-type buildings in the camp, with mess halls and that sort of thing for the rank and file worker without his family.

DR. CRAWFORD: How did that work? Did that save problems with your construction force?

MR. WEISS: Yes, Norris Dam would have had a hard time recruiting the people and counting on them being on the job. Of course, that was at a time when you could get just about anyone you wanted. But even then, Norris was pretty far from the centers of population and having the construction village and camp did help, I would say, in a great way the economy of construction of the dam.

DR. CRAWFORD: Had that sort of thing been done before in construction camps, to your knowledge or experience?

MR. WEISS: Oh, yes. As I stated at the beginning, we did have construction camps and villages--villages just for maybe ten or so top key personnel at both Conowingo and Bagnell.

DR. CRAWFORD: Was there nothing particularly new, then, about this plan at Norris?

MR. WEISS: Well, the new part about the plan at Norris was the permanent village--the type of houses they built for the permanent village. The chief architect at that time, as I recall, was Roland Wank and he had some pretty far-out ideas, in the construction personnel's estimation, on how far he wanted to go.

DR. CRAWFORD: Were they generally put into practice?

MR. WEISS: No, they were pretty well watered down by the time they came out into the field. He did have some very good assistants. He had a man, and I can't recall his name, who had had charge of a large subdivision construction in Charlotte, North Carolina, and I think, Kingsport, Tennessee. And then there was Louis Granger, an architect. I believe he was out of Boston, and he was pretty well down to earth. He had charge of the actual drawing of the plans, so by the time they got through those people's hands they were pretty reasonable. And then we did have a down-to-earth architect on the job who had done a lot of work around Chattanooga-Norbert Manning, and Norbert Manning knew the construction building work inside, out. He could go out and do the actual work and when something looked a little too material, so to speak, why we did contact the home office at Knoxville and get them to change things. And he also helped construction forces out quite a bit in carrying out some of the details that the carpenters and masons ordinarily would not have come across in their general run of work.

DR. CRAWFORD: When you left Norris, then you went to Hiwassee, I believe?

MR. WEISS: Yes, I went to Hiwassee, and Hiwassee was organized pretty much as Stone and Webster jobs were organized. Some of the top officials in TVA at that time were ex-Stone and Webster officials. I think it was a George Rich who was Chief Design Engineer or Assistant Chief Design Engineer on the dams and power houses, and then Theodore Parker who had been, as I recall it, Chief

Engineer for Stone and Webster, and they, in turn, had recruited a lot of ex-Stone and Webster general superintendents and craft superintendents.

DR. CRAWFORD: Many of your engineers had worked together for a few construction f ms, hadn't they? Stone and Webster, Morgan Engineering Company, and others?

MR. WEISS: Yes, my own force included several Stone and Webster engineers with whom I had been associated on these jobs--Bagnell Dam, for instance. John Boyd and Ted Hartman, and we did have an especially good office engineer, Fitts Cousel, who had worked with a contractor in New Jersey and Philadelphia and knew how to really take off plans and get the most out of the construction dollar from the field standpoint.

DR. CRAWFORD: Were the construction projects you were associated with economically managed? Did you stay within the budget as you felt you should.

MR. WEISS: Yes, I'd say they definitely were because the construction people were down to earth and we made as certain as we could that the designers followed standard practices. The thing that we had the hardest time getting across to designers as far as Norris Village was concerned was the matter of using standard door sizes, window sizes, and that sort of thing. They went to odd sizes, which we started out with but required a lot of extra expense and constructing in our shops. But as far as the dam construction was concerned, there we had, I would say, a typical Stone and Webster Construction organization from the engineering right through the craft supervision.

It so happened that on Hiwassee Dam our reconstruction organization general superintendent was a . . . I'm trying to think of the name of the construction firm. I'm sorry I can't remember the name of the construction firm right now, but he had been with one of the top-notch construction firms of the country on dam construction, and the assistant superintendent had been with the aluminum company many years, constructing the dams in the North Carolina area--Santeetlah, Calderwood, Topoka, and so on. So all these people knew dam construction from the ground up. We were fortunate in having as our project manager, Clarence E. Blee, who had been with a utility company on the West Coast, and our assistant construction engineer, Jack Partridge, had also had extensive utility construction experience on the West Coast dams. And the construction engineer came to us from the Bureau of Reclamation. He was O. F. Larguard. Of course, he had a different conception of how dam construction should be carried out. It was different from the utility construction concept. As I said, he was with the Bureau of Reclamation, and he followed their methods, and this did cause a little disturbance among the engineers who were use to getting the most, as we put it, "out of the construction dollar." But I think even there the utility background engineer's ideas prevailed and we think that we got Hiwasse Dam built about as cheaply as any organization in the country could build it.

DR. CRAWFORD: About what year did you finish Hiwassee?

MR. WEISS: We finished Hiwassee in 1940 and many of us moved on then with Clarence Blee and Jack Partridge to Fort Loudoun Dam near Lenoir City, Tennessee, not far from Knoxville. This was a dam on the Tennessee River and was the dam closest

to Knoxville having a lock constructed.

DR. CRAWFORD: Was your work easier there in that you were nearer headquarters?

MR. WEISS: No, I don't think that made too much difference. The only difference it made was that we had many more visitors, especially foreign visitors, being close to Knoxville headquarters, but as far as helping the construction organization or design, I don't think it made too much difference. The TVA set-up of having a project engineer who looked after that particular project in the Knoxville office and came out on the job frequently, kept the work flowing fairly smoothly.

DR. CRAWFORD: When did that plan of having a project engineer start?

MR. WIESS: As far as I know, TVA had a project engineer right from the start of its dam construction.

DR. CRAWFORD: Did you have any special problems in building Hiwassee?

MR. WEISS: No, I would say that all dams have a little something different--a little trouble perhaps with the floods or something of that sort--but as a whole, Hiwassee went pretty much as any utility dam might have gone. Since it was pretty much of a rock foundation, there was very little overburden. We did have a little problem in copperdam construction instead of driving steel sheet piling like the dams on the lower Tennessee River, timber cribs were resorted to. Timber cribs were also used at Norris Dam. No, I'd say there

wasn't too much difference between Hiwassee and any utility dam that I've been on. One, you might say, unique feature of it was that we made all our own aggregate. We opened up a quarry and put in crusher equipment and sand manufacturing equipment, and all of our concrete aggregate; that is, rock and sand, came from the quarry that we developed at Hiwassee. We did do something probably a little unusual in the type of quarry blasting that we carried out--the type of large 9-inch diameter holes that we drilled with well drills, and . . .

DR. CRAWFORD: Was that new in construction?

MR. WEISS: It was fairly new. It had been used before, but we consulted various powder companies--Atlas and Hercules, and so on--to get their best methods of blasting, and we used what was called nitromon and also, as I recall it, toward the end of the blasting period we did use some ammonia nitrate which was a little different, but had been developed by the powder companies. Another thing that we did make use of to ensure lower construction costs was the cableway that had been used in the construction of Norris Dam. That cableway had been developed by one of the engineers in the construction plant division of TVA that had as its job the layout of the concrete plants and the highways and railroads --whatever we needed to keep the construction organization moving.

DR. CRAWFORD: Do you know who had invented or developed this?

MR. WEISS: Yes, Adolph Ackerman. Adolph Ackerman is now a consultant engineer out at Madison, Wisconsin, I believe. I don't know whether he does a little teaching on

the side at the university or not, but he is out at Madison. He developed this particular interlocking cable that had been used at Norris Dam, and we did use the same structure. I believe we had to get a new cable because it wasn't long enough for Hiwassee Dam, but the structures were re-erected at Hiwassee Dam. The concrete was placed from buckets that were brought by rail from the concrete mixing plant to a point underneath the cableway on the right abutment of Hiwassee Dam, and picked up by the cableway and the buckets were taken to their placing locations.

DR. CRAWFORD: Was this patented--this cableway?

MR. WEISS: Yes, I'm pretty sure it was. The cableway idea was not new, but I think that the thing that was new was the actual type of cable that was used on this particular cableway. I believe also in the fact that (I might be wrong here) one tower was fixed and the other tower moved on a track. During the operation of the cableway, there was a tail tower that was, as I recall, fixed. It could be moved up and down on a track also, but during the placing of concrete the only tower that moved was the head tower, and that was on the abutment.

DR. CRAWFORD: After your work at Fort Loudoun Dam, what job did you undertake next?

MR. WEISS: Well, after Fort Loudoun Dam, TVA had a slight lull in its construction and rather than move on to some tied-over job, I completed the final report in the field and decided that I would go into business with an engineer who was then working at Oak Ridge, Vernon Coleman, whose home was in Asheville,

North Carolina. It so happened that he couldn't get away from his job for almost six to eight months so we didn't really form a consulting firm in Asheville until some time in 1946. I left Fort Loudoun in May of 1945, so I believe it was some time in 1946 that we actually got underway as a consulting firm in Asheville, North Carolina. Our work was some survey work, but mostly we were trying to service the industries and towns around the Asheville area--the towns on water supply and sewage disposal and industries in anything that they might have. We did a dam designing supervision job for the Champion Paper and Fibre Company at Canton, North Carolina. This was on the Pigeon River. The Champion Paper and Fibre Company had J. A. Jones of Charlotte to come in and do the actual construction work, but we, as I said, did the design and supervision. And then Beacon Blanket in Swannanoa, North Carolina, needed some new warehousing facilities and also more efficient reworking of their conveyor system in the warehouse and in the blanket plant itself, and he helped them out on it. And also they had a dam that was leaking very badly--their water supply dam--and we investigated the trouble there and ended up by doing some grouting for them that plugged up the dam and made it usable again.

DR. CRAWFORD: How long did you work in this private engineering?

MR. WEISS: Well, we were gradually building up our organization and were just about to bring in some top designers from outside who would head up our sewage and water supply organization and highway organization. We hadn't done any highway work up until that time, but we were going to build up our organization so

that we would be able to handle larger things. A Chattanooga firm, Louie Schmidt Engineering Company, I believe, and our outfit and Polk, Powell, and Hendon of Birmingham went together to try to get the Asheville water supply job, which included a dam up in the North Fork River outside of Asheville. We had a consulting engineer from Cashiers, Rick Dale, to help us. But with all this, the engineering force of Charles T. Mane, which had been Asheville's consultant over the years, actually did get the work. But at about this time my partner became sick. He had arterial troubles and it looked as though he just wouldn't be able to continue, physically. Of course, he was at that time, I believe, the Director of the First National Bank of Asheville and his father was Chairman of the Board and he, you might say, had the finances to keep our firm going. Well, with him out of the picture it looked as though we had just better disband, which we did, and at that time I did contact TVA to see what they might have.

DR. CRAWFORD: What year was that?

MR. WEISS: That was 1949. They said that they were going to get into the steam power plant construction in a big way. They had one small plant at Watts Bar and at the time it was built, somewhere in 1945, that was considered a very good plant--60,000 kilowatt units. The Johnsonville Steam Plant on the Tennessee River near, at that time, the small town of Johnsonville, Tennessee, was to be their next steam plant. It was expected to construct units of a magnitude of, I think it was 90,000 kilowatts, and the initial construction called for four units. Well, I was hired as construction engineer. I might mention that when I finished the job, Fort Loudoun Dam, I was acting project manager. I started

there as a field engineer and then advanced to assistant construction engineer. And as different ones of the personnel went to other jobs, why I was moved up to acting construction engineer, and then finally when the project manager, Joe Black, went with Ebasco Services down to South America, I became acting consturction engineer and finished up the last unit at Fort Loudoun Dam. So when I was hired for Johnsonville Steam Plant, I was hired as construction engineer.

DR. CRAWFORD: And that was your first job after returning to TVA?

MR. WEISS: That's right. I could have continued with TVA as a lot of others did--just hanging on-- but I liked something active.

DR. CRAWFORD: You are glad, then, that you had the period in business for yourself?

MR. WEISS: Oh, yes. Even though it turned out as it did. I was very much interested in the challenges that we had there and working with these different organizations.

DR. CRAWFORD: And it was a different experience, of course.

MR. WEISS: Oh, very much so, yes.

DR. CRAWFORD: Now, there's a period there we haven't covered in much detail, Mr. Weiss, between the completion of Fort Loudoun Dam and '46, during the wartime period.

MR. WEISS: Well, during that time we did a little traveling and pretty much stayed around our place here in the mountains.

DR. CRAWFORD: When did you leave TVA?

MR. WEISS: In May of 1945 until sometime in . . . I don't remember whether it was the Spring of '46, but we were pretty much around this area.

DR. CRAWFORD: When did you become associated with Andrews area?

MR. WEISS: Well, that happened when we were at Hiwassee Dam. In 1939, during our drive around the countryside, we happened to see this place for sale and it was owned by a man who had a tannic acid extract plant in Andrews. We believe at that time he knew that a highway was going to be built through here and he expected the highway to be built right through the property. That was 1939, so this place looked very good to us and we bought it, and then in 1941 we actually did hear that the highway . . . Well, the first we knew, we saw stakes that had the center line of the highway going right through the building, so I did a lot of propaganda work and whether that was what paid off . . . I contacted the North Carolina Highway Department's chief engineer and then I had the highway engineer of TVA contacted. He had been chief engineer of the Tennessee Highway Department, and did a lot of talking and sending pictures and so on, and whether that did the trick or not, we didn't have any problem. They took about 30 feet of the border along the existing highway, so that's the background of our place here, and we've held on to this. We've been in and out of TVA and we have a very good neighbor over here, Riley Cochrane, who has kept his eye on the place. We were out in Montana for about six years and when we came back, it was just as it was the day we left it.

DR. CRAWFORD: When were you in Montana--after you retired from TVA?

MR. WEISS: I left Shawnee Steam Plant job up in Paducah, Kentucky. We were in the process of putting in the tenth unit when I left, and they were even larger units than previous units. We had gotten up to 150,000 kilowatt capability. I believe I had left Johnsonville before any units were completed. I left Johnsonville when we were just starting the construction of two more units to make it a 6-unit plant and those units had gotten up into the 100 and some kilowatt capacity. But while at Johnsonville early in the project, the project manager there, due to family problems--he was from the Muscle Shoals area--wanted to move back to Muscle Shoals--John Counts--so TVA put him in charge of their Muscle Shoals area work and moved me in as project manager at Johnsonville Steam Plant.

DR. CRAWFORD: What years did you work at Johnsonville?

MR. WEISS: Johnsonville--I worked from I think it was April of 1949 until January of 1951, and I can't recall just when I became project manager. But I'd say most of that time or a great portion of that time it was as project manager. Our superintendent at that time was Henry Johnston, and when I left Johnsonville Steam Plant to go to organize Shawnee construction forces, Hendon became project manager at Johnsonville. Of course, the whole idea of the Shawnee Steam Plant was that we were building something for the AEC Plant, Atomic Energy Plant, at Paducah, Kentucky.

DR. CRAWFORD: I believe you supplied power to them then?

MR. WEISS: Yes, we were going to supply power and that was at a time when they had thousands of employees. We got up to 3,000 or something like that on our project and then Ebasco had a project across the river at Joppa, Illinois. They had several thousand people building a steam plant that was also to supply power to the Paducah AEC Plant and there was competition between TVA and private industry. That was the thing that was pushed in all the newspapers--that here was TVA on the one hand building a power plant to supply AEC, and here was private industry, headed up by Ebasco, building the Joppa plant.

DR. CRAWFORD: I believe that Dixon-Yates developed out of that situation for one thing.

MR. WEISS: Well, yes. And during this time Ebasco had a lot more labor problems than we did. We had plenty of labor problems. The only thing that I believe, and I don't think a lot of present TVA people will admit it, but the thing that really kept that project going was the fact that we had a top-notch labor relations man right on the project.

DR. CRAWFORD: Was he Ted Schultz by any chance?

MR. WEISS: No, that was Jess Orill. Now Jess Orill had been a top man--an international representative --of the boiler makers out of Chattanooga before he joined TVA. He saw a greater future in TVA so he came over to TVA. But he knew labor inside, out, and any labor problem I had Jess Orill would sit in on it and he helped me to no end. We had lots of strikes; we had in the neighborhood of 40-some odd strikes during the time of that job, but that was a small number compared

their labor was just taking over everything on the project. They sold liquor on the project, gambled on the project, but we kept our project going like a construction project, probably at the expense of a lot of these labor disputes. In fact there was one labor representative--business agent in the iron workers--and he even told the international representative of the iron workers that he expected to be a labor czar in that area--Bill Sanders. Bill had been one of the ones that allegedly had gone along with the teamsters and several other organizations, and caused a lot of property damage to some construction firms in Calvert City when they were starting that industrial complex there. So Bill, by his pressure methods, tried to keep his men in line on our job; that is, we got one of our craft, iron-worker superintendents who made a reputation as a low cost constructor on one of the other projects and got him up to help us. Anyway we were having a lot of labor problems and we had (Shawnee started out as a 4-unit job and TVA, because of the type of labor area we were in) thought the thing to do was to make contracts with the top organizations in the field of boiler making and iron erection--structural steel erection--and turbo-generator installation. So they made a contract with Babcock and Wilcox for the installation of boilers. Babcock and Wilcox had had years and years of experience. They knew how to handle labor, or at least that's what they said. And American Bridge had years and years of experience and they knew how to handle their labor. They would give us a cheap job. We would give them a contract and they would get us a economical job. The trouble is with Babcock and Wilcox--they've got a cost-plus contract and there was no limit. But TVA even then thought they'd be ahead of the game--that here was this big outfit that dealt with

the boiler makers and knew how to handle their labor. They would get the lowest number of man hours.

Well, from the start you could see things beginning to slide. We also had a pipe-fitting outfit on the job--B. F. Shaw. B. F. Shaw, by the way, did a little better job than the rest, but things began to slide. They had the contract for the first four units. Babcock and Wilcox was supposed to build a boiler for about 100,000 man hours. The first unit got over 200,000 man hours and that amounted to quite a few dollars. The second unit was not much better with all the pressures we tried to bring on and going to visit their home office and so on. We couldn't get it much better, and their work was slow. We did actually manage to meet the schedules, but it took a lot of hard work to meet those schedules and a lot of labor. It was about that time that we decided we had better get a labor relations man on the job. Jess Orill was given to us and Jess tried to help the contractors to straighten their work out, but in most cases they said they didn't need any help. They knew how to handle it. They had their own labor relations organization. Well that went on, and we decided we didn't want any more contractors on the job after the first four units. There was no reason we couldn't afford to hire ourselves and do a cheaper job and do the next six units with our own forces and really save the TVA some money.

Well, George Leonard who was the construction engineer at that time agreed with us that that was probably the thing to do so we picked outstanding, young men from the various jobs who had made a pretty good reputation for themselves. In various cases they had come up from the ranks in TVA as apprentices. One man became our general assistant superintendent and an-

other man became our craft superintendent of iron work and these people were real go-getters. But when they got up to our area--they had never experienced the labor difficulties in their areas--and they were hard put to really bring their people in line. But as I say, with Jess Orill in the picture and his close contact with labor relations in Knoxville. . . George Leonard had a labor relations man, Glenn Dooley, and they in turn worked with the international organizations with whom TVA had the general agreement. That was one thing that we had over the private organizations. TVA had this general agreement between the international representatives of the various international unions and TVA management in which certain conditions were set up. As a whole, that worked ideally on these other jobs. They followed these conditions pretty well, but when they got into this labor area up at Paducah even the international representatives could not keep their business agents in line. Their business agents wanted to tell the international representatives where to get off. The business agents were little czars in this particular area.

DR. CRAWFORD: What was wrong with the labor situation in Paducah? Why was it such a problem?

MR. WEISS: It was such a problem because there were too many jobs. The men could go just where they wanted and the private organizations had to deal pretty much with the business agents. But we had it over them a bit in that we dealt directly with the international organization. We got into this business of doing our own job, and the first thing we came up against that we had to solve "right now" was this matter of man hours on boiler erection.

So Jess Orill and I took several trips to international headquarters at Kansas City, Kansas, and talked to the president of the organization there and to his people, and they were behind TVA one hundred percent. They saw the TVA had done big things for the labor organization and they were out to try to back us up, but the local business agent out of Louisville, Dutch Schultz, tried to run a little organization of his own just like the others and keep things pretty much under his own fingers.

But little by little the international organization, by sending top-notch men--resident international representatives--out on the job who were really strong-arm men . . . They had been through the East St. Louis wars and they were use to machine guns and that sort of thing and knocking people on the head. They didn't actually have to resort to that sort of thing but they had a reputation of having been through this war business in East St. Louis. Eddie Peach was one of the toughest guys. He had been a sparring partner for Jack Dempsey at one time and Eddie would just go around and talk quietly to the job stewards, and pretty soon those fellows would just quiet down and go about their business. Well, pretty soon we got down to the point where we got . . . I don't remember just what we averaged in the way of man hours but--I know that our last unit was put in with something like 80,000 man hours, something like that. But I think our unit number five was quite a bit below 200,000 man hours. But each succeeding unit dropped, and we saved TVA on those man hours. I know it was pretty close to a million and a half on the man hours alone. But as I said, we decided that we would take Westinghouse over, do our own installation. We'd hire a superintendent out of the Westinghouse Plant to be our advisor, and we supplied all the per-

sonnel. And then the same way when it came to putting in the structural steel for the other units. We didn't need any help there. Our structural steel men knew their structural steel work. But we did get this top-notch man, who had made a reputation on other TVA jobs, down to help us, and the business agent got next to him and put pressure on him by threatening him with bodily harm and harm to his family and so on, and he decided he wanted to be transferred back on the other jobs again.

But little by little the international representative, together with our labor relations man could sit right in there and talk as tough as Bill Sanders, the business agent of the iron workers, could and Bill would come in and say, "well, if you don't do so and so, and give us such and such conditions, why we're going out on strike." There were a couple of cases where we said, "Well, we just can't see going along with you at all on that." Bill would say, "Can't you go along with a little something? Look, I've gone to all this trouble and we expected and we hoped that you would at least go along with us on a little something." That was one thing that we just wouldn't do as far as the job was concerned, was compromise.

Some of our people in Knoxville probably will never agree on what I'm about to say, but I know very well that they compromised quite a bit in order to keep labor peace. Well, Glenn Dooley knew pretty well what we were going through out on the job but George Leonard didn't. George Leonard was for keeping peace at almost any price. I know he had this construction maintenance crew on the job to build our access highways, and the superintendent of that crew, Ed Tate, was a man who had been use to working with a contractor. Ed Tate had worked with a contractor before the depression days

in Chattanooga--road building contractor. In fact he had been in business for himself and he knew how to get jobs done cheaply.

But we had a problem with the Teamsters and the Teamsters had a reputation. They were in on this alleged trouble at Calvert City and they were supposed to be considered tough, and George Leonard felt the thing to do was to give in a bit. They had some demands; I don't remember just what they were --something about the number of truck drivers they wanted to have on the job and they didn't want any contract truck drivers to be anything but union members, and they wanted us to go along, and that would have compromised Ed Tate considerably. Ed Tate just couldn't see that, and it would have lowered his cost; Ed wouldn't do that, and it wasn't too long that Ed just resigned from TVA. But there were these pressures from Knoxville to compromise and maybe in the final analysis there was some compromise, but as far as my organization is concerned, we tried to hew to a hard line along with Jess Orill and get the job done the cheapest way possible with the least number of strikes.

DR. CRAWFORD: Well, you had the international representatives on your side, didn't you?

MR. WEISS: We had the international, but the international representatives, in turn, were a little chicken on pushing the business agent. This one guy, Bill Sanders, was actually kicked out of the iron workers organization and Bill Sanders told the international representative one time that he was like a dictator. He felt that he was the equivalent of a dictator. He had the powers of a dictator; he had almost the powers of life and death of his members. By golly, as I said, and no one can prove this but I know darn well that it happened--they would break

his arm, break his legs if he didn't leave the job or quit. For instance, a foreman who had been pushing his men too much; that sort of thing. So Bill felt he was a dictator and some of the other fellows . . . Well, there's one man in jail right now who is still in federal prison--Dale, the head of the labor organization over at . . . He didn't cause us so much trouble. He didn't want to battle the international representatives on our side too much, but he just about took over this Joppa job that Ebasco was on. In fact, he caused Ebasco to lose its contract. Ebasco lost its contract and Becktel took over the Ebasco fiasco. Of course, all that trouble, as I said, that Ebasco had kept them sliding farther and farther behind, and even with our 50 or so walkouts we still managed to meet the schedule.

DR. CRAWFORD: You were still on time?

MR. WEISS: Yes, we were still on time. We got quite a write-up in the paper about beating private industry and that sort of thing.

DR. CRAWFORD: How did Bill Sanders get thrown out of union work?

MR. WEISS: He took a lot of money out of the treasury. I think that was the big thing. The story was that he got a couple of hundred thousand. Whether he did or not, I don't know, but he had a huge organization up there, working all these jobs. He got money from all these people that came in from other parts of the country. He would get certain dues out of that, so they said. As I said, you can't quote anybody. The information was that quite a few hundred thousand dollars disappeared when Bill was kicked out of the organization. They

couldn't pin it on Bill, but it disappeared just the same. The last I heard, Bill was a carpenter foreman on Barkley Dam when they were building it up near Paducah. I don't know what Bill is doing now, whether he is in the labor movement again or not, but I understood Bill was trying to get back in the labor movement in another craft.

DR. CRAWFORD: Now, that was the trouble at Shawnee?

MR. WEISS: That was the trouble at Shawnee, yes. Labor was a pretty big trouble there.

DR. CRAWFORD: And that was unusual for your projects, wasn't it?

MR. WEISS: Oh, yes. Things have gone pretty smoothly heretofore. Of course, little by little, with more of these projects being built, there was a little dropping in production --not very noticeably at first, but it was happening.

DR. CRAWFORD: And that was your responsibility--to maintain efficient production?

MR. WEISS: Oh, yes. Get an economical job and get it built on schedule.

DR. CRAWFORD: What year did you leave the Shawnee job?

MR. WEISS: I left Shawnee, I think, it was in 1956. That was the year they were still working on the tenth unit and the only thing they had ahead for me at that time was to go up to Johnsonville and put on a couple more units up there. And Ebasco came to see me. Ebasco was very interested in our job, so all their top officials --their president, vice-presidents, and so on--whenever they went over to

Joppa, they would come visit our job and we'd show them around.

DR. CRAWFORD: They were impressed by your project.

MR. WEISS: Yes, they were impressed by how we did it and so on. Well, we'd tell them everything we could. Anyway, I got acquainted with the president and vice-president, and so on, and various labor people. So about the time we were working on the tenth unit they wanted to know if I would be interested in going out to Montana and managing a dam hydro job out there. And at about the same time I got an offer from some outfit that Perrinie and several others were involved in up on the St. Lawrence Seaway job. This was to handle their office engineering. Well, that didn't sound very challenging. This going out with private industry on a new job, starting the job from scratch and so on was a lot more challenging so I accepted Ebasco's offer.

DR. CRAWFORD: Is that A-b-a-s-c-o?

MR. WEISS: No, Electric Bond and Share Company. Now it's a subsidiary of Boise Cascade, and it was known Engineering Services Incorporated. Well, they still call themselves that--Electric Bond and Share Company. Electric Bond and Share Company, just before the depression, ran practically all the utility companies in the East and the Securities Exchange Commission, I think, was organized and they had to divest themselves of all their ties with all these utility companies, so they became just another contracting company. But since then, they are up in the Fortune's top 500 engineering and construction organizations.

DR. CRAWFORD: How long were you with them? Six years?

MR. WEISS: I was with them from about '56 to '62, yes.

DR. CRAWFORD: Did you return to TVA in '62?

MR. WEISS: I came back to TVA in '62, yes.

DR. CRAWFORD: How long did you remain with them then, and what did you do, Mr. Weiss?

MR. WEISS: Well, coming back with TVA, they didn't have anything of the magnitude that I was interested in getting back into; that is, managing a steam plant job or anything like that but they said that they were expecting to expand a little and if I'd come back with them and go . . . They were going to get into tributary area development work. They were going to pioneer in that field, and they had this project--the Beech River Tributary Area Development--which consisted of about seven earth dams and about 80 miles of channel improvement work, the idea being to build these dams to take care of the flood waters and improve the channels to improve the run-off so that instead of having maybe three or four crop losses a year, they maybe wouldn't have any crop losses for several years. And that sounded like a challenging thing. It was something new and so I did get with them in that, and about the time that was coming to a close they hadn't really gotten a party to go on to any new tributary area development work, but they were getting into something new up at the Land Between the Lakes. It was something that President Kennedy had given them authority to develop, which was a section of land between the lakes.

It was between the Kentucky Lake, formed by the Tennessee River, and the Cumberland Lake, formed by the Barkley Dam on the Cumberland River, and this was about a 12 or 13 mile stretch of land about 40 miles long. It was a pretty wild country. Not many good farms on it and in fact, the main part

of it is known as the Golden Pond area, which in the prohibition days was the source of Al Capone's moonshine, so it was so wild that there were lots of moonshiners still in the area. And TVA had quite a problem buying up the land from the natives because it had been in their families for so long. It wasn't worth much, but anyway they bought up the land and developed it into a park area. I don't know if you've been up to that area. It's quite a park area though.

When I came back Hendon Johnson was chief engineer or director of construction, and I told him that I didn't want to come back unless there was a chance of something bigger developing. Well, Hendon said he would keep his eyes open and there would be something, and he did. At about the time TVA decided to determine whether a nuclear plant would be better than a fossil fuel plant, they brought me in the picture there and I spent quite a few months in the Knoxville office. We were analyzing costs and working up construction costs and working up construction plans of how we would handle either a nuclear job or a fossil fuel job, and it turned out that a nuclear job would be the cheaper of the two, so that's what TVA decided to build. Browns Ferry Nuclear Plant was their first attempt at nuclear installation.

DR. CRAWFORD: Did you remain with TVA until that started?

MR. WEISS: Oh, yes. I organized that job and got it underway. We started there in September of '66 and then we got a permit from AEC in July of '67, and we were fairly well advanced with our foundation work for three units when I left. I was retired in December of '69. Up to that time there wasn't much actual nuclear knowledge involved in the construction work. It was pretty much straight-going construction work, but my construction engineer, Bill Kelligan, had a

for that sort of thing.

DR. CRAWFORD: You believe they are sufficiently safe, then?

MR. WEISS: Well, they were not only safe when we were starting out, but things have changed considerably from the time I got into the picture and what they are right now. They're getting into a lot more different types of safeguards than they did in our original design. Right now, I'm a part-time consultant for Ralph E. Parsons Company. They're one of the top three or four engineers in the country, and they wanted to get into nuclear work, and hadn't done any power plant work, so they asked TVA whether they knew of anyone who would be willing to work with them part time in possibly getting a nuclear job with Detroit Edison. And George Palo, who was manager of engineer construction, said, "Yes, Fred Weiss will probably be interested and he's available. I'm pretty sure he doesn't want to do full-time work." Parsons wanted someone to manage the job, and I wasn't interested in full-time work. That's something for a younger man. Now days there's too much of a labor problem in production and so on. It takes an aggressive, younger man to continually handle them. There's a lot of tension there and I personally don't think an older, retired man should get out and try to start something that's new in the organization.

DR. CRAWFORD: Still, you've had a lot of experience in labor relations.

MR. WEISS: Oh, yes. Well, I can point all this out to the new outfit that's coming into the picture, see? Like I did meet with Parsons, and I went up to Detroit and met with Detroit Edison and we have a job started now--Firmey #2 Nuclear Plant on

background of nuclear experience of both Oak Ridge and he had been up as resident engineer on the Shippingsport Plant, the first commercial nuclear plant --Shippingsport near Pittsburgh, so Bill had a good nuclear background. He knew what would be involved as we got further into the engineering and planning of the project.

DR. CRAWFORD: What was different about the nuclear plant? What different plans did you have to make?

MR. WEISS: Well, the difference in the nuclear plant and the fossil fuel plant is that the craft work is a lot more exacting. You have to meet the specifications of the Atomic Energy Safeguard's Committee. And to meet those requirements, to start with, the design has to be a lot more exacting. There are a lot of safeguards, a lot of redundant installations of controls and so on. It's a lot more exacting.

DR. CRAWFORD: You feel that the AEC standards are probably adequate then?

MR. WEISS: Oh, yes. Yes. In fact, there are quite a number of plants in operation at the present time. I don't know what the latest figure is, but there are quite a number of plants in operation and they are doing very well. But they had a hard time getting into operation because they would come up with certain defects in welding that had never been encountered before and that had to be ironed out, and different types of things. But the Safeguard's Committee, I think, is outstanding in its requirements and I know there is a lot of propaganda to maybe even go slower on nuclear plants, but I don't see any reason

Lake Erie. It started out in a small way. We haven't gotten a permit from AEC yet, but expect to get it this fall, and they have done a lot of excavating work and backfilling work and put in some discharge channels that . . . You see, there's a Firmey #1 nuclear unit that is not the same type of unit that is being built now. The unit being built now is an exact duplicate of the ones that were put in at Browns Ferry. That's another reason that they got me into the picture up there, but this Firmey #2 is a boiling water reactor developed by the General Electric Company and Firmey #1--the unit that is in there now is sort of a conglomeration of ideas and it was sponsored by quite a number of power companies. They put money into it. They had some troubles and the unit was out of service for quite a bit of time and they finally got it operating again, but that's the small unit--I think, about 30,000 kilowatts.

DR. CRAWFORD: Would you make any guesses about the future power supply of TVA? I suppose hydro capacity is just about completely developed, isn't it?

MR. WEISS: Hydro is pretty well developed, yes. They'll get a few extra kilowatts out of maybe putting additional units in some of these river-run plants on the Tennessee River, and they might get a few additional kilowatts out of some of these tributary projects, like up at Tim's Ford Dam, but they do have some of the larger streams --the Duck River and the Elk River. They still have some prospect of some hydro plants there, not very big, but the future of TVA is either fossil or nuclear plant development.

DR. CRAWFORD: Would you have any estimate as to which it

should be, or what percentage?

MR. WEISS: No, sir. I wouldn't. As I understand it, maybe it's been decided. They're in the process right now of deciding on two more plants--whether they're going to be fossil fuel or nuclear--and they do have a second nuclear plant; that is, pressurized water reactor which is developed by the Westinghouse Company that's under construction outside of Chattanooga--Sequoia Steam Plant. And as I say, there might be two more nuclear plants or there might be two more fossil plants. They are pushing a big fossil fuel plant at Cumberland, Tennessee. That's a unit that puts out almost a million kilowatts. In fact, against our 100,000 kilowatts . . . In other words, one unit nowadays can almost do what ten did back in the days of Shawnee.

DR. CRAWFORD: Do you have any idea of what the capacity of a nuclear plant is? The ultimate capacity?

MR. WEISS: No, sir. And I don't think anyone else does. No, I think what they say is that as far as the reactor part is concerned, it's just a matter of adding more turbo generators, but it hasn't been tried. Right now I think about 1,200,000 kilowatts is the largest plant--roughly what we had. We had 1,150,000 kilowatts at Browns Ferry. And as I say, the Detroit Edison Plant will be a duplicate of that.

DR. CRAWFORD: Do you have any ideas about the present concern with thermal pollution as a result of the nuclear plants?

MR. WEISS: Oh, I know there is a lot of concern, and there

is probably a good reason for concern but even the private companies are carrying out laboratory work in the field as to just what the effects of this heated water will do to the fish population and the plant vegetation in general. TVA is spending something like a million and a half--maybe it's up to two million now--on a field laboratory where they'll have a number of basins in which they'll have different temperature waters from the condenser water discharged and will study the effects on different textures of plant life and fish life. As I understand it, down in Florida--the Crystal River plant of the Florida Power and Light--they've been doing a lot of checking and they claim that some of their 90-degree water (well I guess it gets up to 100 degrees)--certain types of fish thrive in that water, so it's all being checked. But at Browns Ferry we started out with the idea of defusing the water into the existing lake on the Tennessee River; that is, by a certain solid line of pipes, ranging from 17 1/2 to 20 1/2 feet in diameter and having certain defuser holes out in the river channel. They would be a certain lenght out into the channel--different lenghts out into the channel. That would diffuse the heated water out into the river and lower its temperature so that we would meet the state requirement of 93 degrees, maximum temperature. Now I think actually the temperature of that water as it comes from the condensers is up somewhere from 110 to 120 degrees, but the requirement was that it would be 93 degrees temperature within a certain radius of those pipes. But there is still conversation that maybe they might have to go to an expensive cooling tower installation which they have put in up at the Paradise Steam Plant. They were discharging, I think, 110 degree water into the Green River up there, and that was just a little

too hot. They actually had to put in these cooling tower installations.

DR. CRAWFORD: You use a good deal of ice, don't you, in cooling or is that in the plant?

MR. WEISS: No, these cooling tower installations are a method of cooling by air--shooting the water up into the tower and letting it come down in contact with the air. And by the time it hits the bottom and is ready to use again, it's lost quite a bit of its temperature. No, I think the ice you're thinking of is in connection with the nuclear plant of pressurized water reactors of the Westinghouse-type of design.

DR. CRAWFORD: I think I read something in a TVA news bulletin recently.

MR. WEISS: Yes, they use the ice to take away some of the heat of the steam. It's in their process of grading steam to be used for driving the turbines, generators.

DR. CRAWFORD: Let me see if we can go back a little.

MR. WEISS: On labor relations, now, I might point out--and here again, I'm probably at odds with Knoxville--as I said, right from our Shawnee days, on, the idea of Knoxville top people was to compromise a little. We'll give a little here and they'll give a little there, but it didn't always work that way. We gave quite a bit, in our estimation, but we got very little out of them, see? And we always expected to get production, and over the years production kept getting less and less and less. Of course, that's not typical of TVA; that's industry in general--construction jobs in general.

DR. CRAWFORD: TVA standards have been higher, I believe, in general.

MR. WEISS: I'd say compared with the average constructions firms, TVA, even with all its compromising and so on, has gotten more out of labor than private industry has. Well, I know because I have been in private industry since I've been with TVA although my information didn't come too much from what happened in Montana. In Montana we were out in the sticks and we had our fingers pretty well on our people out there. We didn't have too much of a problem there. We usually got eight hours work for eight hours pay, but as soon as you get into metropolitan areas where there are lots of jobs available that's where you get your difference. I've made several trips to nuclear plants in various parts of the country, out to Monticello, I think they call it. That's out in Minnesota and that's really out in the sticks. They get almost their full production there-eight hours work for eight hours pay. But then you get up near the Chicago area--the Dresden Nuclear Plant of the Commonwealth Edison--I think they're even a little worse than TVA in production.

And then up in New Jersey, which is the worse place in the world for labor, the Oyster Creek Plant was about two to two and a half years behind schedule, and I think I'm right in saying, mostly because of their problems with labor. Part of it was meeting the requirements of the Safeguard's Committee of the AEC. They had lots of problems; they were new, see--a lot of new methods used and so on, so they had a lot of new things that they had to get the kinks out of. But then another plant that we contacted was the Niagra Mobil Plant--nine-mile point, up near Buffalo--and they didn't have

too many problems. They were handling it pretty much like TVA, but Oyster Creek turned it all over to G. E. . It was a G. E. job and G. E. lost millions and millions on that job. I've heard figures--25 million, 30 million--but they did lose a lot of money on that job and based on that job they gave up their turn-key jobs. But TVA, little by little . . . I know when I go back and talk to Bill Kelligan, all Bill can talk about is lack of production. He's got 2800 men and he could use half of that number if he could get eight hours work out of them.

DR. CRAWFORD: You believe the quality of work has declined, then, over a period of time?

MR. WEISS: Well, the quality can't decline, it just has to be redone. It just has to be redone. Instead of two percent defect in wells, which is considered fairly normal. . . See, all wells are x-rayed; they have to meet all the x-ray specifications for defects. Two percent defects would have to be cut out and redone, you get fifty percent. That sort of thing.

DR. CRAWFORD: Has that been the degree of change?

MR. WEISS: Maybe not quite that bad--maybe twenty percent. Say twenty percent has been the degree of change. And then too with so many jobs in the picture, as soon as one job goes on overtime and you're still working a 40-hour week, you lose all your top men. They move off on this overtime job. And, as I say, out in Washington or out in Montana--that was the job for the Washington Water Power Company of Spokane, Washington. We didn't have too much trouble with labor. But then they moved me up into New Jersey. Presumably they were going to get a pump

storage dam job never developed. They told me: "Just move your furniture up to New Brunswick, New Jersey, put it in storage and get a place for three months at a time and this pump storage job will open up." The pump storage job never did open up. The boiler job for the Consolidated Gas Company, and the area office, warehouse, and distribution point near Woodbridge, New Jersey --about twenty-five miles from New York City--and that's where we ran into all kinds of New Jersey labor problems. There we found that a contractor, by giving a business agent a little money, could get some of his labor problems taken care of and then unions, of course, were getting the highest labor rates in history. And I notice in the engineering magazine here that the operating engineers expect to get about $120 a day, for a 6-hour day or something like that, and a 5-day week. Of course, the unions are fighting it, but I don't know whether it will work. They'll probably get what they want, but New Jersey is really bad. So TVA, compared with Detroit Edison work up in the Detroit area, it's a lot different.

DR. CRAWFORD: Do you believe TVA has generally had better service from its employees, from the laborers, than private industry?

MR. WEISS: They have had, but the time is here again as far as top management is concerned. They wouldn't agree with me. I'm afraid that one of these days TVA is going to have to do something like the Bureau of Reclamation. They're going to have to go out and take bids on little jobs instead of doing the jobs force-account like we did. They just can't get the production.

DR. CRAWFORD: That didn't work too well before with TVA,

did it, taking bids?

MR. WEISS: No, that's where we lost so much money up there on the first four units at Shawnee.

DR. CRAWFORD: You did not like the cost-plus contract, then?

MR. WEISS: No, no, not being with people of the calibre of Babcock and Wilcox. We found that even people of that calibre, that had years and years of experience, they couldn't hold labor in line. But the whole picture in the country is less and less production--industry as well as construction.

DR. CRAWFORD: Are these the basic causes of labor problems?

MR. WEISS: Well the basic causes are that the union representatives or business agents keep promising the men less work for more money. When it comes down to it, that's what it really is. When we get what we call a good foreman who gets work out of his craftsmen, those craftsmen complain to the union that they are having to work a little harder than Jim Jones' man over in another section of the plant, when they begin to pressure this fellow. In fact we know that they even pressure some of the craft supervisors. All these craft supervisors hold their union membership and they actually fine the craft supervisor a couple of hundred dollars and also threaten to take away his retirement rights and things of that sort. Now here again somebody wouldn't agree with me, but we know it's happening. I've had craft supervisors come to me and say, "Look, I had to pay the union $300 because they said that they were going to take away my membership because I was pushing the men too hard." And he actually had to pay it. We tried to get our labor relations people to put pressure

on the international representatives. Well, they did; they talked to the international representatives, but these international representatives talk two ways. When they talk to you, why they're talking against the business agent, but when you have a strike or anything and they go out there and meet the business agent they do just what that business agent says he is going to do. At the same time they tell you that they told the business agent that he was doing wrong. But they're 100 percent behind the business agent, so you get these people working two ways--talking two ways.

DR. CRAWFORD: TVA certainly started at a time when the labor situation was favorable.

MR. WEISS: Well, it was definitely favorable. Everybody needed a job. That's why most of us went with TVA. We didn't have any place to go and TVA did get excellent people. They got all these heads of big companies, people that the companies just couldn't hold anymore.

DR. CRAWFORD: What things did you look for in setting up a labor camp--construction camp? What made a good one?

MR. WEISS: Well, the thing that made a good one, of course, was the cheapness of the housing and the quality of the food, cheapness of the food, and recreational facilities. One of the reasons TVA gave up a labor camp was because they finally got to a point where they had to subsidize out of the construction funds, the labor camp. But that was all right as long as you couldn't get labor. And that was another thing that did help us at Shawnee--that we had our own labor

camp and we were able to help things that way.

DR. CRAWFORD: Did TVA generally supply benefits--recreational activities and so forth--for work men at the sites?

MR. WEISS: Yes, yes. That's right. Yes, they usually had a recreational director.

DR. CRAWFORD: Do you think that was a help?

MR. WEISS: Oh, yes. It kept the men occupied. I know it was a help because I know the type of camp we had out at Bagnell, for instance. We couldn't house all the men. We were out in the sticks and we couldn't house all the men in the construction camp, so little towns sprang up. Construction camps sprang up at Bagnell, and boy, there were all types of shacks--no sanitation; privies here and there; no planning whatsoever--and pretty soon spinal meningitis developed. It actually got into our own area. We had our own hospital and so on. We actually had to set up isolation wards. But I mean the filth and so on . . .

DR. CRAWFORD: That sort of thing didn't ever happen in TVA camps, did it?

MR. WEISS: Oh, no. Of course, in these construction camps--purely construction camps--you had gambling joints and your red light districts, houses of prostitution. We had the same thing outside our camp at Conowingo, Maryland. We had a little section there where you could gamble until your heart's content and you had the women out there and so on--dance halls and liquor flowed

freely. You don't have that in the construction camp itself, you see?

DR. CRAWFORD: Did that sort of thing ever turn up at any TVA sites?

MR. WEISS: No, no. Oh, yes it did in the surrounding towns. Some of those things threatened when you began to hire a lot of people, but TVA was able to work--had its own law enforcement group that was deputized by the county and they worked closely with the county so that movement of liquor and that sort of thing was at a minimum. They were able to help the county put these people in jail and I think that helped to keep things pretty well under control.

DR. CRAWFORD: Let's see. The TVA labor camps generally, at least occasionally, had mess halls, didn't they, and recreational facilities?

MR. WEISS: Oh, yes--mess halls--that's what I was going to say. The quality of food, the cheapness of food and quantity--that all helped with the labor.

DR. CRAWFORD: You had a healthy, regular labor force, then?

MR. WEISS: Oh, yes. Yes, that's helped considerably. But as time went on, when more of these jobs were built near population centers, TVA felt it just wouldn't pay to keep up these construction camps, so at Johnsonville we still had a camp; at Shawnee we still had a camp; Kingston had a camp; we had a camp up the river too. But it wasn't very long before they gave up the construction camps.

DR. CRAWFORD: Did you have any difficulty with colored laborers?

MR. WEISS: No, we never had any problem, even when this business of getting more colored supervisors on the job came into the picture. At Browns Ferry we hired an assistant general labor foreman. He was one of the salaried foremen who was a black, and of course, we had always been use to using, especially down in the South here, Negro labor. We had Negro foremen. There are certain parts of the TVA now--certain areas of the TVA--where they just weren't used to Negro labor.

DR. CRAWFORD: You had that trouble at Fontana, didn't you?

MR. WEISS: At Fontana, I think, for a while they even had trouble with the Indians--Cherokee Indians--but it seems to me at Shawnee we had a Negro camp--separate Negro camp. That was before this integration business came into the picture.

DR. CRAWFORD: Were your camps usually segregated? Your labor camps?

MR. WEISS: Labor camps were usually segregated along until Shawnee where we started out as a segregated camp, but about the time we got into the middle of the job we began to change things around--had integrated mess halls and integrated toilets and bunk houses and what not. In the deep South, though, Negros pretty much stayed to themselves. There might be a few people who pushed themselves, but not too many.

DR. CRAWFORD: That was not a problem, then, in many of the camps?

MR. WEISS: Not at any of the jobs that I was on, but I know that they have had problems. Even with our apprentices, we tried to get a certain proportion of the Negro apprentices. We had a little difficulty with some of the labor unions there. They don't like this business of displacing the white man with a black man.

DR. CRAWFORD: No.

MR. WEISS: And they would throw road blocks in our path. Here again, the international representatives would sit up in Washington or some place and say, "We think that's the thing to do--to integrate and get Negro apprentices--that's the way we're going to get these jobs done and so on--have civil rights." But when he'd get down to that local business agent, he'd put the pressure on his people that, "Look, if we can get away with it now, we're not going to put on any Negro apprentices. Those Negro apprentices are going to have to pass certain tests of the union," and they made the tests of the union a little tough--tests that maybe the white man might not even run up against. I don't know, but I suspect that the white man didn't run up against them.

DR. CRAWFORD: I suppose it was fortunate that most of TVA's construction took place at a time that labor relations were good.

MR. WEISS: I'd say so, yes. And then they were able

to bring those labor relations along; that is, especially between TVA top management and labor top management. I don't know just how it is now, but for a long time TVA top management and labor top management thought pretty much alike on what you should get out of a man, production-wise. And they would try to impress that on their business agent, but a lot depended on how the business agent's people worked in that particular area. Down at Browns Ferry we were a little unfortunate in having the big mass of labor from Huntsville to contend with. They had gotten away with a lot of things over there at Huntsville that TVA would never have put up with, but little by little we had to put up with some of the things that Huntsville labor put up with, or supervisors put up with. No, at Shawnee, as I say, the big innovation was getting to force account contracts; that is, TVA doing the work.

Since then TVA has tried to do all of its work force account except for the specialty jobs--brick laying and plaster work, window installation --speciality work. And there we go out for competitive bidding. Even on painting--we thought that at Shawnee, in this case, our own people were pretty well tied down by the area practices. They weren't giving production, so we decided at Shawnee that instead of having our own painters do the work of painting the power house, we would contract that. And we got some bids, and from our bids we knew that we just couldn't (these were lump sum bids) meet those bids so we contracted our painting and came out all right. Now since then I don't know. TVA has built up some pretty good paint organizations and in some cases they've gone back to

their own painting, I guess. But as far as the other work is concerned, TVA pretty much does its own work.

At Browns Ferry, TVA management got the idea that . . . Well, it wasn't entirely TVA management's idea . . . that the containment vessel for the nuclear reactor should be built by some boiler-maker outfit that had experience of building pressure vessels of various kinds, and then, too, the pressure vessel people said: "Now, look, if we design this vessel for you, (TVA wouldn't design it. These pressure vessel people would do it.) we want to do the erection because that's where some of our profit is." Well, we had to go along with that on the first two units because General Electric had the contract, but on the third unit TVA was to make its own contract with the pressure vessel people--Pittsburgh-DeMoines Steel people--and we said, "Let us do it. We can save TVA quite a bit of money on the erection and we'd be able to coordinate the work better," because when you have your own labor forces you can make your plans accordingly. You didn't have them wanting to erect plates while you were trying to place concrete in a certain area. Of course, their idea to do the cheapest job is: you get out of the way and let us be in the clear here and do the whole job--let us get our work done and then you come in, but you can't build a construction job that way. You have to mesh it--coordinate the different crafts and the different contractors. Of course, that's what Detroit Edison is doing. Detroit Edison does all their work with contract so Parsons there does the coordinating of that work for Detroit Edison. And Becktel and some of the others do too--United Engineers, J. E. Jones. But this business of production, that's

where you get hurt now--where it's beginning to go the other way. TVA is beginning to get as much production as private industry.

DR. CRAWFORD: As little production.

MR. WEISS: As little production, yes. As little production as private industry. And all these engineering magazines you read, every issue deals with production. Well, for that matter every issue of business magazines deal with lack of production. That's why we have inflation, because the labor costs are going up so much more than the manufactured equipment that is being produced.

DR. CRAWFORD: But this change has been fairly recent in TVA, hasn't it?

MR. WEISS: Well, no. This started little by little back in the '50's.

DR. CRAWFORD: But most of your hydro production was over by that time, wasn't it?

MR. WEISS: Oh, yes. Most of the hydro production was over, that's right.

DR. CRAFORD: What was your job, Mr. Weiss, after you completed Fort Loudoun Dam?

MR. WEISS: After I completed Fort Loudoun Dam I did go into this private business, Coleman and Weiss Engineers of Asheville, North Carolina. We were consulting engineers and also did a little survey work, mostly in conjunction with our construction jobs. And our idea was to service private industry and municipalities. And then when that organization was dissolved due to the

illness of my partner, I did go back with TVA.

DR. CRAWFORD: In '46?

MR. WEISS: In '49 on Johnsonville Steam Plant.

DR. CRAWFORD: Yes. From '46 to '49 you were . . .

MR. WEISS: I was in private business--Coleman and Weiss. And then from Johnsonville--'49 to '51--I was in Johnsonville. And then from , I think, it was '51 to late '56 I was on Shawnee, and then came this opportunity to head up the Washington Water Power Knox and Rapids Hydro-Electric Development at Knoxson, Montana. That was to build the hydro plant and to do all the reservoir relocation there. We had 20-some odd miles of the main line of the Northern Pacific Railroad to relocate which included relocating the trackage and building about five major bridges and we had several miles of state highway--I think it was called Highway 101 at that time; it's called Highway 200 now--to relocate along with some major bridges and about 40 miles of county roads. All of the reservoir relocation work --reservoir clearing, many things that had to do with creating a lake, a reservoir--due to building Knox and Rapids Dam.

DR. CRAWFORD: Which of your TVA jobs did you consider the most interesting?

MR. WEISS: The Shawnee job, by all means, with all the problems we had there--labor problems --and so on. Very few people will ever have anything like it. Well, we had our top international representative of iron workers sleeping in a motel over in Cairo, Illinios, with bodyguards outside his motel room

with machine guns, and things of that sort.

DR. CRAWFORD: That was the international representative?

MR. WEISS: Yes, yes. Charlie Hobbs.

DR. CRAWFORD: That was a very tough situation.

MR. WEISS: Yes, well that's what I say. A lot of people won't admit that those things have happened but I know they happened. I didn't actually see them, but Charlie Hobbs told me about them, and I'm pretty sure there were times when Charlie Hobbs almost broke under the pressure. But these boiler makers--boy, they knew their stuff. Of course, they had been through all this tough-going in East St. Louis--boiler maker problems there.

DR. CRAWFORD: It was fortunate that you had the international representatives on your side, wasn't it?

MR. WEISS: Yes, right. That's what we, I think, had over Ebasco. Although Ebasco, I know, did deal directly with international representatives when we were out in Montana. It happened that out in Montana Fred Swimmer was the production manager out of the New York office, and he had joined Ebasco. He had several jobs, and my job was one of them, and Fred would come out maybe for a week or so every month and see how things were going. We had a labor relations man in our New York office, Hugh Rectorstreet, who dealt directly with Mike Graney. He's now a big man in labor on this . . . I don't know if you remember reading about Blough, who . . . Wasn't it Blough who was president of the U. S. Steel Corporation and set up

this special labor board?

DR. CRAWFORD: Yes, Roger Blough, I believe.

MR. WEISS: Roger Blough set up this special labor relations round table board. Well, Mike Graney was the top consultant with that board. And Mike Graney, at the time I was out in Montana, was our labor relations man. We had some little troubles--but they were just minor, and Mike got most of them settled. And then from Montana we moved up into New Jersey on these jobs where we were going to work until we got this hydro job--pump storage job--that never developed. I had to get professors of various colleges who were going on sabbatical leave and people who were taking tours and get their houses so we could work from month to month, you might say--three months, six months at a time--and not rent a house because we never knew. And then the way that worked out was that we suddenly hit a depressed period in the first of '62 when they wanted to put me on leave without pay. And it was at that time that I contacted TVA again to see what they had available and that's when I went on the tributary area development work.

DR. CRAWFORD: And your Land Between the Lakes work?

MR. WEISS: That's right, and then from the Land Between the Lakes work into Browns Ferry Nuclear Plant.

DR. CRAWFORD: Are there any parts of your TVA work we haven't covered that you want to get on the record, Mr. Weiss?

MR. WEISS: Well, the public relations aspect of the

construction job--what good or harm a person's family can do in the community. And in my case I was very fortunate that Mrs. Weiss fitted right into each community we lived in and became part of the organizations in the community--garden clubs and study clubs and different women's groups--and in that way she was able to also keep contact with the wives of the leaders and if there were any questions concerning TVA that might be detrimental, she could always set them straight also. There have been cases where wives of project managers have really hurt the work of the whole organization because they were very unhappy when they moved in; they didn't like the house they were living in; they didn't like the territory they were in; they didn't like the people, and in my case, as I say, I was very fortunate in that Mrs. Weiss did fit into every group that we entered.

DR. CRAWFORD: You also fitted in, I believe, Mr. Weiss, in your work in the Rotary and other things, which was good, of course.

MR. WEISS: Oh, yes. Yes, of course--Exchange Club in Waverly, and Rotary Club in Lexington, Tennessee, and the Rotary Club in Athens, Alabama.

DR. CRAWFORD: Was that a common practice of project managers?

MR. WEISS: No, TVA doesn't even indicate that that may be a good idea, but I found that the more you can become one of the people you are living with, the more you'll get them to thinking your way about public policies--policies relating to

labor, for instance--and also the small matter of concessions on the job and that sort of thing.

DR. CRAWFORD: You generally put this into the job wherever you were, didn't you?

MR. WEISS: Oh, yes. Yes, I very definitely made that part of the job itself; that is, away from the construction.

DR. CRAWFORD: Well, that's only a part of TVA's public relations, but I know they've been good throughout in the area.

MR. WEISS: Yes, well I know I'm not the only one who's done that same thing. I know, for instance, Hendon Johnston. He was a member of the Exchange Club there at Waverly too and he was a Rotarian here at East Pittsburgh and that sort of thing. It all goes toward the people knowing that you're not just a construction tramp, so to speak of, on the job. Actually we do come and live in a place for three or four years and then we move on, but while we're there we try to become part of the community.

DR. CRAWFORD: Well, it seems that you've succeeded in those places.

MR. WEISS: We feel that we have and I know a lot of the other people have, and as I say, the main thing is that Mrs. Weiss has been a great contributor to a lot of this public relations whether other people can see it or not. A woman has a lot of influence in a small community--what she does good or bad is

watched more so than a man.

MRS. WEISS: Well, I can see that influence here for the good just . . . Oh, I forgot that you were taping. (Laughter)

DR. CRAWFORD: Is there anything else now that you can think of that we should get on the record at this time, Mr. Weiss?

MR. WEISS: I can't at this time. I'll probably think of dozens of things after you leave.

DR. CRAWFORD: Perhaps we can get together in Athens. Thank you very much, sir.